

## **LISTING OF CLAIMS**

This listing of claims will replace all prior versions and listings of claims in the Application.

1. **(Previously Presented)** A method for remote emissions sensing with NO<sub>x</sub> detection capability comprising the steps of:
  - determining an occurrence of a predetermined triggering event;
  - initiating an ambient reading of ambient NO<sub>x</sub> concentration present prior to a vehicle passing by a system for remote emissions sensing, the initiation of the ambient reading being based on the determination of the occurrence of the predetermined triggering event;
  - taking an exhaust plume reading of an exhaust plume of the vehicle as the vehicle passes by the system for remote emissions sensing; and
  - subtracting the ambient reading from the exhaust plume reading to provide a concentration reading for the NO<sub>x</sub> present in the vehicle emissions.
2. **(Previously Presented)** The method of claim 1 further comprising the steps of taking a blocked beam reading prior to taking an exhaust plume reading and when the vehicle is in a beam path of a source beam of the system.
3. **(Cancelled)**
4. **(Cancelled)**
5. **(Original)** The method of claim 2, wherein the blocked beam reading measures baseline current or noise in the system and wherein the blocked beam reading is taken after the ambient reading but before the exhaust plume reading.
6. **(Previously Presented)** The method of claim 1, wherein a range of wavelengths over which readings are taken is selected to be substantially centered around a characteristic wavelength such that a number of data points for which there is no significant NO<sub>x</sub> absorption is minimized.

7. **(Original)** The method of claim 1, further comprising the step of subtracting a baseline intensity from each exhaust plume reading to compensate for changes in radiation intensity.
8. **(Previously Presented)** The method of claim 7, wherein the baseline intensity is calculated using a substantially linear region over an absorption dip.
9. **(Original)** The method of claim 2, wherein the ambient reading is taken just prior to the blocked beam reading.
10. **(Previously Presented)** A system, having a source beam of radiation, for remote emissions sensing with NO<sub>x</sub> detection capability comprising :
  - means for determining an occurrence of a predetermined triggering event;
  - means for initiating an ambient reading of ambient NO<sub>x</sub> concentration present prior to a vehicle passing by the system, the initiation of the ambient reading being based on the determination of the occurrence of the predetermined triggering event by the means for determining;
  - means for taking an exhaust plume reading of an exhaust plume of a vehicle; and
  - means for subtracting the ambient reading from the exhaust plume reading.
11. **(Previously Presented)** The system as claimed in claim 10 further comprising a
  - means for taking a blocked beam reading when the vehicle is in a beam path of the source beam; and
  - means for subtracting the blocked beam reading from the exhaust plume reading.
12. **(Cancelled)**
13. **(Cancelled)**

14. **(Original)** The system of claim 11, wherein the blocked beam reading measures baseline current or noise in the system, and where the blocked beam reading is taken after the ambient reading but before the exhaust plume reading.
15. **(Previously Presented)** The system of claim 10, wherein a range of wavelengths over which readings are taken is selected to be substantially centered around a characteristic wavelength such that a number of data points for which there is no significant NO<sub>x</sub> absorption is minimized.
16. **(Previously Presented)** The system of claim 10, wherein changes in an intensity of the source beam are compensated by subtracting a baseline radiation intensity from each exhaust plume reading.
17. **(Original)** The system of claim 16, wherein the baseline intensity is calculated using a substantially linear region over an absorption dip.
18. **(Currently Amended)** A method for remote emissions sensing with NO<sub>x</sub> detection capability comprising the steps of:
  - taking an ambient reading of ambient NO<sub>x</sub> concentration present prior to a vehicle passing by a system for remote emissions sensing;
  - taking an exhaust plume reading of an exhaust plume of the vehicle as the vehicle passes by the system for remote emissions sensing;
  - subtracting a baseline intensity from the exhaust plume reading to compensate for changes in radiation intensity, wherein the baseline intensity is ~~calculated~~ interpolated using a substantially linear region over an absorption dip; and
  - subtracting the ambient reading from the exhaust plume reading to provide a concentration reading for the NO<sub>x</sub> present in the vehicle emissions.
19. **(Previously Presented)** The method of claim 18 further comprising the steps of taking a blocked beam reading prior to taking an exhaust plume reading and when the vehicle is in a beam path of a source beam of the system.

20. **(Previously Presented)** The method of claim 19, wherein the ambient reading is taken at predetermined intervals and wherein a most recent ambient reading is stored and used in connection with the blocked beam and exhaust plume readings for each vehicle.
21. **(Previously Presented)** The method of claim 19, wherein the blocked beam reading measures baseline current or noise in the system and wherein the blocked beam reading is taken after the ambient reading but before the exhaust plume reading.
22. **(Previously Presented)** The method of claim 18, wherein the ambient reading is initiated at an occurrence of a predetermined trigger event.
23. **(Previously Presented)** The method of claim 18, wherein a range of wavelengths over which readings are taken is selected to be substantially centered around a characteristic wavelength such that a number of data points for which there is no significant NO<sub>x</sub> absorption is minimized.
24. **(Previously Presented)** The method of claim 19, wherein the ambient reading is taken just prior to the blocked beam reading.
25. **(Currently Amended)** A system, having a source beam of radiation, for remote emissions sensing with NO<sub>x</sub> detection capability comprising :
  - means for taking an ambient reading of ambient NO<sub>x</sub> concentration present prior to a vehicle passing by the system;
  - means for taking an exhaust plume reading of an exhaust plume of a vehicle;
  - means for subtracting a baseline radiation intensity from the exhaust plume reading to compensate for changes in an intensity of the source beam of radiation, wherein the baseline intensity is ~~calculated~~ interpolated using a substantially linear region over an absorption dip; and

means for subtracting the ambient reading from the exhaust plume reading.

26. **(Previously Presented)** The system as claimed in claim 25 further comprising means for taking a blocked beam reading when the vehicle is in a beam path of the source beam; and

means for subtracting the blocked beam reading from the exhaust plume reading.

27. **(Previously Presented)** The system of claim 26, wherein the blocked beam reading measures baseline current or noise in the system, and where the blocked beam reading is taken after the ambient reading but before the exhaust plume reading.

28. **(Previously Presented)** The system of claim 25, wherein a range of wavelengths over which readings are taken is selected to be substantially centered around a characteristic wavelength such that a number of data points for which there is no significant NO<sub>x</sub> absorption is minimized.